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/Since a considerable number of Soviet scientists are mentioned in this report, a collector's alphabetical index of names and paragraph references is included at the end of the report./

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2. In general, prior to 1941, Soviet work relating to acetylcholine and cholinesterases was concerned primarily with the mechanism of the action of acetylcholine, although some groups were working specifically on cholinesterases. Most developments relating to cholinesterases have, of course, occurred in the intervening years. However, since the two fields of investigation are closely related, the Soviet work in acetylcholine is an important background for deductions relating to cholinesterases research. Those laboratories and scientists concerned with acetylcholine are very likely to be those working on cholinesterases, and the level and extent of work in acetylcholine is an indicator of potential achievements in cholinesterases. 50X1 50X1 50X1

3. The Laboratory of Kh. S. Koshtoyants:

a. This was an outstanding center for acetylcholine research.

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50X1 b. Koshtoyants was Deputy Director of the Institute of Evolutional Morphology imeni Severcev in Moscow, under the USSR Academy of Science, in 1940-1941.

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c. Koshtoyants was interested mainly in the comparative nature of the transmission of nervous impulses in the nervous system, and from the nervous system to the muscles. He was also concerned with comparative aspects of cholinesterases, mostly in invertebrate animals, and the character of the inhibitory processes of cholinesterases activity. Four articles by Koshtoyants

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"About the Manner of Action of Acetylcholine Found by a Biological Test, and about Cholinesterases among the Invertebrates", Bulletin of Experimental Biology and Medicine, Vol 2, p 37, 1936.

"About the Study of Mechanisms of Action of Chemical Mediators in Invertebrates (Acetylcholine and Potassium)", Ibid, Vol 2, p 185, 1936.

(Popular Soviet Scientific Journal) Nature (Priroda), Vol 5, p 77, 1936.

Third Meeting Devoted to Physiological Problems (several volumes on specific physiological problems), p5, no year. Published Leningrad.

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d. His laboratory, in 1940-1941, consisted of some ten rooms, with good equipment. Although the usual visitors receptionist was present at the main entrance to the Academy of Science building, and visitors registered, Koshtoyants's laboratory re-

50X1 flected no additional security precautions No special permission to visit was required. There was no mention of military implications to the research in Koshtoyants's laboratory 50X1

e. Koshtoyants' collaborators were:

(fnu) /I S ?/ Artemov and (fnu) Bekbulatow (cf. "About the Content of Acetylcholine-like Substances in Nerve Ganglies /centrums/", Bulletin of Experimental Biology and Medicine, Vol 5, pp 379-81, 1938).

/Artemov/ and /R L/ Mitropolitanskaja (cf. "About the Content of Acetylcholine-like Substances in Nerve Tissue, and Cholinesterases in Hemolymph Crustacea (Arthropods)", Ibid, Vol 5, pp 382-385, 1938). 50X1

[redacted]

(Note: The references in paragraph 3 above, except that in sub-paragraph (b), were taken from: "Review of Chemical Transmission of Nerve Impulses", by N V Yermakov (Kiev), Advances of Modern Biology, Vol VI-1, p 79.)

4. E B Babskii's Laboratory: 50X1

a. The laboratory of Evgenij Borisovich Babskii was located in 1940 in the Tihomirovski Building, Bolshaja Firogouskaja 51-57, Moscow. [redacted] Until 1937, he worked in the All-Union Institute of Experimental Medicine, and also at the Moscow State Pedagogical 50X1 Institute. [redacted] he is now /1953/ (together with K M Bykov or (fnu) Rosenkov) one of the leading official physiologists in the USSR. 50X1 [redacted] His textbook on physiology is very good, and before World War II was recommended for university medical students.

b. Babskii was one of the first Soviet scientists to work on cholinesterases in the USSR. 50X1 His laboratory collaborators [redacted] were: 50X1

B M Kisluk
I G Kovyrev
A A Markosjan
N A Raspopova

A A Kirillova
P F Minaev (cf. "About the Change of Activity of Cholinesterases in Nerve Tissue under Electrotone", First Session of Moscow Society of Physiologists, Biochemists, and Pharmacologists, pp 170-172, Medgiz (Publisher) Moscow, 1941.)
E A Kukushkina (research laboratory technician) (cf. with A D Arkhipova, "Change in Activity of Cholinesterases in the Ontogenesis of Mammals, Bulletin of Experimental Biology, Vol II, pp 533-535, 1941.)

This group worked mostly on acetylcholine, rather than cholinesterases. Babskii was primarily a physiologist, with the capable scientist's tendency to pick a direction of research and follow it through. He liked experimental work,

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c. The principal aims of Babskii's group were to investigate:

(1) Physiologically active substances formed in brains and nerve trunks under excitement, and to determine the functional role of such active substances;
(2) Whether these substances which formed in nerve systems are circulated in blood, and whether if present they affect some organs (not directly enervated by nervous excitement) through the blood /ie whether they have functions as hormones/;
(3) What is the chemical nature of these substances, whether during nervous excitement only acetylcholine and sympatin (or maybe some other physiological substances) are formed?

(Note: This indication of aims is derived from personal memory and "Investigations of Physiologically Active Substances Formed during the Excitement of the Nervous System", Scientific Notes (Uchenye Zapiski), Dept of Physiology, Moscow State Pedagogical Institute, Moscow, 1938; entire volume is devoted to the work of Babskii's laboratory.)

d. Babskii's laboratory was more or less involved in cholinesterases determination.

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no work planned on inhibitors for cholinesterases.

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5. The Sanitary Institute at Kiev:

a. This institute conducted secret research, especially military research. their workers were paid very well, which was probably required by the reluctance of many scientists (particularly prominent scientists) to work at this secret institution.

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work at the Sanitary Institute at night was Bella Hajkina, who was conducting cholinesterases and acetylcholine research connected with some form of gas poisoning. She investigated the activity of cholinesterases and the content of acetylcholine in the lungs after this poisoning. (fnu) Hershenovich was her chief in this work on the action of poison in gases. There was a large staff at the Institute and, according to Hajkina, everything they needed in the way of equipment.

b. Bella Hajkina

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In the daytime, she worked with S E Epelbaum in the Department of Muscle and Nervous System Biochemistry at the Institute of Biochemistry in Kiev. (At this time, A V Palladin was Head of this Department and Director of the Institute.) Epelbaum's group in the Department worked on the metabolism of carbohydrates and phosphorate compounds in the brain. Hajkina later went to the Ural mountain region

in the USSR as a biochemist in the Biochemistry Department of some school of medicine.

6. D E Alpern's Laboratory:

50X1 a. D E Alpern, the pathological physiologist headed a group at the Ukrainian Institute of Experimental Medicine and the First (?) School of Medicine in Kharkov. He was principally a clinician, attempting to investigate the amount of acetylcholine in blood under the condition of various diseases, and also the activity of cholinesterases in blood and other tissues under these same conditions.

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b. References of scientific publications by Alpern 50X1

Chemical Nature of Nervous Excitement in Human Beings, Ukrainian Institute of Experimental Medicine, Ministry of Health, 1939, 230 pp (with French language abstracts).*
This book formed the basis of his laboratory experiments:

Archives of Biological Sciences, Vol 48, p 160, 1937; Vol 51, p 65, 1938; Vol 51, P 60, 1938; and other references to Alpern's work on cholinesterases.

Physiological Journal of the SSR, Vol 24, p 25, 1938.

50X1 c. scientists working in Alpern's laboratory:

E N Berger (cf. Archives of Biological Sciences, Vol 51, p 73, 1938). Worked on research relating to cholinesterases.

N N Anosov (cf. ibid, Vol 51, p 69, 1938). 50X1

T F Fesenko

d. From a logical point of view, the research problem under investigation in Alpern's laboratory in 1941 had at least an indirect military significance.

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8. First Medical Institute of Kiev:

In the Department of Physiology (Head of Department: (fnu) Voronzov), /F N ?/ Serkov, a full professor second in command, was engaged in some form of cholinesterases and acetylcholine research.

9. Kiev University:

50X1 (fnu) Yemchenko was head of the Department of Physiology and also Director
50X1 of the Institute of Physiology at the University. there
50X1 was a woman who was doing graduate work in acetylcholine and probably cholinesterases. This work was at the Master's Degree level.

10. Physiological Institute Imeni Pavlov, Leningrad:

Study of the effect of acetylcholine upon the mechanism of muscle contractions (effect of hronaxia, etc). There was a large group here, working in general in pure muscle physiology.

A G Ginetzinsky (cf. "Cholinergic Structure of the Muscle Fibre", Journal of Physiology, Vol 33-No 4, p 413, 1947; Vol 32, p 76, 1946.

N I Mikhelson (cf. Biological Issue, Isvestia Academi Nauk, No 1, p 13, 1943.

N M Shamarina (cf. "About the Cholinesterases Content in Embryo Heart", Physiological Journal SSR, Vol 28 - Issue 6, p 650, 1940; Biological Issue, Isvestia Academi Nauk, No 2, 1943; Trudy (Works) of the Physiological Institute Imeni Pavlov, Vol 1, 1945.

E U Chenykayeva

N A Itina (cf. "About the Reactivity of Muscles to the Drugs which Affect Sympathetic and Parasympathetic Nerves", Bulletin of Experimental Biology and Medicine, Vol 29, 1941.)

G P Konrady

K M Bykov (cf. About the Chemical Nature of Nervous Excitement in the Central Nervous System", Physiological Journal USSR, Vol 21-Issue 5-6, 1936.) Bykov worked on the humoral transmission of nervous impulses, and to some extent with acetylcholine and cholinesterases problems. Bykov also worked at this time [c. 1941] at the Institute of Physiology at Leningrad University.

11. Institute of Physiology, Moscow

L S Shtern, Director of this Institute, worked on acetylcholine as one of the metabolits of the brain. With her was one (fnu) Kassel, and another collaborator was P A Sesynin (cf. "About the Content of Acetylcholine-like Substances and Activity of Cholinesterases in the Brain Tissue of Different Animals, First Session of Moscow Society of Physiologists, Biochemists, and Pharmacologists, p 218, 1941.)

12. Beritov's Laboratory, Tbilisi, Georgia, USSR

I [S] Beritov (Georgian name: Beritashvili) (cf. "About the Action of Acetylcholine on the Skeletal Muscles of the Frog, Physiological Journal SSR, Vol 27 - Issue 6, 1939, p 667.) There was a large group working under Beritov [c.1941], with very good equipment; at times, this was also a very influential scientific group. In Beritov's laboratory was S P Narikashvili (cf. Two articles in Bulletin of Experimental Biology and Medicine, Vol 7, pp 139 and 286, 1939.)

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13. Leningrad

B N Chernigovsky worked in acetylcholine (cf. "About the Nerve-Humoral Regulation", Advances in Modern Biology, Vol 9 - Issue 3, p 387.)

14. A A Zubkov (cf. "Acetylcholine and Central Inhibition", ibid, Vol 12 - Issue 2, 1940, p 350.)
P N Seribrjakov and H R Chapikova (cf. "About the Humoral Transmission of Nervous Impulses", First Session of Moscow Society of Physiologists, Biochemists, and Pharmacologists, p 216, 1941.)
A Ya. Pyabinovskaja (cf. Doklady SSR, Vol 23 - Issue 9, p 953, 1939.)

15. A number of laboratories in the USSR were involved with the pharmacological aspects of the action of acetylcholine, and the inhibitory action of different substances on cholinesterases. Some were located in Moscow and Leningrad.

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16. In addition, there were at least two large groups involved in the study of cholinesterases and acetylcholine in Molotov, USSR. (fnu) Mereshinski was working here.

17. There was another group similar to that immediately above in Sverdlovsk, USSR.

18. Some scientific groups were involved in the study of synthetic phosphoric organic compounds. in 1940, a book was published on this matter, devoted entirely to the problem of esters

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This book indicates that the Soviets were at that time at a level of organic chemistry which would make it possible for them to supply compounds with cholinesterases inhibitory action.

19.

50X1 20. the Soviet journals in which cholinesterases research is most likely to be found are:

Biokemia
Physiological Journal of the SSR
Archives of Biological Sciences
Bulletin of Experimental Biology and Pathology
Reviews of Modern Biology
Journal of Pharmacology 50X1
Journal of Pharmacology and Toxology (?)

There were also classified (Secret) Soviet scientific journals with letter designations (A,B,C,etc). There was exchange secret literature between military institutes;

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50X1 21. one very interesting article on the action of different pharmaceutical 50X1
drugs upon the activity of cholinesterases, published by some laboratory in Moscow.
50X1 appeared in the Journal of Experimental Biology somewhere around 1937.

50X1 22.

23. The institutions at which classified research on cholinesterases would most likely be conducted

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Sanitary Institutes (e.g. Kiev, Moscow),
Medical Military Academies (e.g. Leningrad, Saratov),
Academy of Chemical Warfare (Moscow),
Medical Naval Academies (e.g. Leningrad),
Medical Air Force Academies (e.g. Moscow),
also possibly selected universities.

24.

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/Collector's Index to Soviet scientists mentioned in this report, and paragraph numbers in which references appear:

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Artemov, /I S ?/	" 3(e)
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